

# ***ANNUAL REPORT***

OF THE

**SIGNAL OFFICER OF THE ARMY**

TO THE

**SECRETARY OF WAR.**

*Rare Book*

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**WASHINGTON, D. C.**

**1863.**

# **National Oceanic and Atmospheric Administration**

## **Annual Report of the Chief Signal Officer, U.S. Army Signal Corps**

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# REPORT.

OFFICE OF THE SIGNAL OFFICER,  
*Washington, D. C., October 30th, 1863.*

SIR :

The average number of officers on duty in the Signal Corps of the Army, since my last annual report, has been one hundred and ninety-eight (198.)

These have served with different armies, and in different military departments, with nearly the following distribution :

In the Army of the Potomac.....	36
“ “ Department of the Cumberland.....	42
“ “ “ “ Gulf.....	15
“ “ “ “ N. C. and Virginia. ....	18
“ “ “ “ South.....	21
“ “ “ “ Susquehanna.....	3
“ “ “ “ Tennessee.....	41
“ Camp of Instruction, Georgetown, D. C.....	22
Total.....	198

The duties of the Corps have been discharged, during the past year under more favorable conditions than when previously reported.

The armies have been older, the generals more experienced, and with a better comprehension of the modes in which the Signal Corps could be best used, have learned to both employ the detachments with their commands, and to appreciate their services. There have been fewer unauthorized interferences with signal duties, and parties have been able to take the field with more complete appliances for the rendering of their services, and with a skill increased by practice. The portable telegraph lines, always necessary for the best success of the Corps, have been furnished at last by a wise liberality of the War Department, and the equipments

for aerial telegraphy and reconnoissance have been improved by such additions as the longer service of the Corps seemed to indicate. The slowness with which the organization of the Corps has, of necessity, been made, has prevented so great a utility as may be hoped from a perfect organization; and it has sometimes been the task of its officers, to bring generals to a conviction of its utility by experience of the service rendered, only to find each changed as he seemed at last to thoroughly understand and rely upon them.

They appear, however, (struggling with all these disadvantages, and fighting while they have been organizing, through all the great campaigns of the last year,) to have maintained an efficiency equalling that of other branches of the service.

It has been a cause of congratulation to officers of the Corps, that their services seemed to be approved and sought for in proportion as generals commanding them have proved enterprising and successful.

The Corps has taken part, during the past year, in every campaign of note east of or upon the Mississippi, and also in some west of that river, in Arkansas and Louisiana.

Detachments were present and serving, at the battle of Ralston Mills, N. C.; battle of Kingston, N. C.; battle of White Hall, N. C.; battle of Goldsboro', N. C.; battle of Murfreesboro' Tenn.; battle of Georgia Landing, La.; expedition against gunboat "Cotton," La.; engagement before Fredericksburg, Va. (from Dec. 11 to Dec. 16, 1862.); expedition against Swansboro', N. C., action at Newbern; expedition against Swansboro', N. C.; action at Newbern, N. C.; (March 14, 1863); siege of Washington, N. C.; siege of Suffolk, Va.; expedition to White House, Va. (from April 11 to May 2, 1863); expedition from Newbern, N. C. (July, 1863); with combined operations of land and naval forces at Baton Rouge and Port Hudson, Miss. (March, 1863); siege of Port Hudson, from its commencement until the surrender of the Port (July 8, 1863); at the attack of the works of the enemy near Charleston, S. C. (April, 1863; during operations at the siege of Charleston, S. C.; expedition to James River, Va., by cavalry force of the Army of Potomac (June 28, 1863); battle of Chancellorsville,

Va.; Pennsylvania campaign; battle of Chickamauga, Tenn.; siege and capture of Vicksburg, Miss.; battle of Gettysburg, Penna.

The exposure of life in this service is, so far as can be judged from returns at this office, about the same as that on other staff duty. The risk of capture, resulting from constant service on reconnoissance and at outposts, is, perhaps, greater than that of any other branches of the service. The casualties of the past year have been as follows :

#### COMMISSIONED OFFICERS :

Wounded in action, . . . . .	4
Missing in action, . . . . .	1
Taken prisoners, . . . . .	9
Deaths by disease, . . . . .	2
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Total, . . .	16

#### ENLISTED MEN :

Wounded in action, . . . . .	6
Missing in action, . . . . .	1
Taken prisoners, . . . . .	22
Deaths by disease, . . . . .	9
Deaths from wounds received in action, . . . . .	1
<hr/>	
Total, . . .	39

#### THE SERVICES OF THE CORPS.

Of the importance of the services of the Corps, and of the benefits resulting to the general service, from their action, there are, at this office, only two means of judging: the demand for the services of the detachments of the Corps, and the official reports of services rendered.

The demands for detachments have been proportioned as campaigns were active. In most of the great campaigns in the past

year, however, the requisition for signal officers has been greater than it was possible to supply. In some instances the number required by generals in the field has been twice that which could be furnished; whilst representations made to generals commanding other military departments, with a view to withdrawing, from such departments, a portion of the Corps, therein serving, for duty elsewhere, have been met by the reply, that the interests of the service required, in those departments, the continued presence of all signal officers there on duty.

I have the honor to submit herewith, as an appendix to this report, (Appendix "A"), the official reports and other papers, bearing upon the operations of the Corps, together with maps illustrating the positions, and such message-reports as indicate the character of the duty; also a number of commendatory letters from military and naval officers. These reports possess an additional value as exhibiting the requirements, as a class, of the officers who have been employed. The publication of these reports can not be injurious to the service, and I recommend that they be published, in order that the department and other officers of the Government, may have clearly before them data (precisely as they exist in this office), from which to judge of the amount of labor rendered by the Corps, and of its value.

With a new organization, provided for duties not previously organized in our army, and coming into existence as a corps during actual war, its standing to be known by its deeds, I cannot think of any plan by which to more justly determine that standing.

In considering the services of the Corps, it ought to be held in mind, that, wherever its officers have been actually on duty, they have rendered a service otherwise impossible; they have forced the enemy to introduce new elements into his calculations of military movements; and they have aided the commanders of our armies with an assistance at first novel to most of them. A few years ago, the modes of communicating (either those of aerial or electric telegraphy) constantly employed by these officers in the campaign in the past year, would have been held mysterious, and the results almost miraculous. If they have made these modes common, and so constantly offered them for the use of generals, that

the results have ceased to longer excite surprise or comment ; and if the duty is now held as something of course practicable with every army, it has become so through the energy and zeal of those upon it.

To them, aside from duties on land, eminently belong the credit of that service, whatever may be its value, which has assured throughout the war intelligent and certain the co-operation of our land and naval forces, wherever they have been on duty.

To contemplate the results of this labor, and the absolute value of the services of signal officers in this war, it is necessary to consider, in brief, the facts as set forth in the accompanying reports.

In the first expedition to Port Royal, the rapid telegraphing among the vessels of the great armada, which the service of these officers gave, through its perilous voyage, were of the best results to the expedition.

No modes approaching to its speed were previously known to general military use.

At the landing at Port Royal ferry, where the United States troops first touched the mainland of South Carolina, their advance could be covered by the heavy batteries of the gunboats, as it was, and necessarily, only by the service of the signal officers who accompanied them.

In all the campaigns of Generals Banks and Pope, in the valley of the Shenandoah, and on the Rappahannock, the detachment of the Corps—its officers on one occasion at least serving within the enemys's lines, and always active—won the regard of those generals, and sometimes determined great movements. The flank movement of Lee's grand army, for the first invasion of Maryland, is reported to have been first recognized from a signal station.

At the siege of Yorktown, officers of the Corps kept the communication with the Navy, lying some miles distant in the bay ; while their stations of observation reached the James river.

At the battle at West Point, Va., without their aid, the naval broadsides could not have been turned, as it were, against the enemy, but must have largely wasted at random.



Before Richmond, at Wilmiamsburg, and at White House, they were constantly on duty, and their service was frequently important.

On the battle-field at Malvern Hill, the aid of signal officers subjected control, from land, the fire and movements of the fleet, through both day's battle. It is difficult to compute the value there of this service; whilst thenceforth, throughout all the service of the land and naval forces on the Peninsula, their aid was in requisition.

At South Mountain and Antietam, signal officers won, by thier conduct and the value of their services, the commendation of the general there commanding.

In the first attack on Fredericksburg, and in the long campaign before that city, they had, for their efficiency, the praise of General Burnside.

In the movements at Chancellorsville, crippled as the Corps was by the failure (through no fault of its members) of some of the apparatus, they rendered such service as that may be, which kept up the communication with General Sedgewick's 6th Army Corps, at that time utterly cut off from the main body of the army; and from headquarters, over the heads of the rebel forces; and when, the retreat being ordered, and the army falling back, in the night upon the river, the pontoons on the right wing of the army were swept away, a message went by their aid, across the swollen river to hold the army in its lines, instead of crowding it, with danger of a panic, on the banks of a torrent it could not cross.

In the movements to Gettysburg, the field telegraphic lines and the signal stations of the Corps, working together, connected army corps, scattered miles apart in front of Washington; and orders went from corps to corps, when the enemy's cavalry prevented the passage of couriers; and even contested with heavy escorts. If the services of the Corps, in this campaign to Pennsylvania, thus expedited the movements of our army by one day to reach the field of Gettysburg, that service alone was worthy of consideration.

When the rebel army, in this campaign, recrossing the Potomac,

hesitated at Martinsburg, as if to return to Maryland, and the army of the Potomac, east of the Blue Ridge, was held uncertain of the enemy's intentions, the information obtained, and which went far to show, if it did not of itself fix their course, elicited, for the Corps, the thanks of the commander of our Army.

In the now (Oct. 30th,) just finished movement of the rebel army threatening the right wing of the Army of the Potomac, near the Rappahannock, it is stated, that the first report of the enemy's design was made from the signal station, on Thoroughfare Mountain, many hours before the counter movement of our Army was needed.

In the movements of the enemy, last spring on the Nansemond, in the Department of Virginia, a Detachment served continuously with our forces. The reports herewith show what part they took in this, and the other operations of that Department.

In North Carolina, a Detachment of the Corps has served, in all the great operations since the attack on Roanoke Island. The reports of its operations, during the attack on Newbern and at Fort Macon are herewith.

Since the last annual report, the marked service of this Detachment has been in the movement on Goldsboro'; in the attack, by the enemy, on the fort opposite Newbern; and prominently, when Gen. Foster, besieged at Washington, was cut off by the enemy's batteries from other direct communication with the relieving gunboats.

In the Department of the South, the officers of the Corps have served, in almost every engagement, since the occupancy of Port Royal; their services culminating in those rendered in the expedition against Charleston, and those at the existing siege of that city, in which, for the now hundred days of its continuance, the service of the Corps, in all its branches,—the use of the Field Telegraph Lines in the trenches; its communication with the Naval forces; and its duties of observation and reports from towers and lookouts,—afford an example of what the duty ought to be everywhere, and of the efficiency to which the Corps can be brought when its officers are supported by official confidence which is their right.

In the Department of the Gulf, the Corps has served, since soon after the first occupancy of New Orleans by Gen. Butler. A Detachment now accompanies the forces of Gen. Banks, in the pending movements in Louisiana. These officers opened the first direct communication from the Upper with the Lower Mississippi, when Rear-Admiral Farragut, running past the batteries of Port Hudson, found himself, after his perilous passage, cut off above that Fortress, from the vessels of his fleet, which could not follow him, and were lying in the stream below.

There is not, perhaps, on record a feat of ærial telegraphy such as that thus and then performed; when from the topmast of the flagship of the Admiral, lying above the Fort, messages were regularly transmitted, past the guns of the Fortress, to a station on the mast-top of the war-vessel "Richmond," five or six miles below. An official letter of Captain James Alden, commanding the Naval forces near Baton Rouge, La., states that the value of this service, at this juncture "can hardly be over estimated." This service I believe, was also officially recognized by Admiral Farragut.

Through the prolonged siege of Port Hudson, the co-operation of our land and naval forces was assured by this party. The reports herewith are interesting; they illustrate the signal service at this siege, the difficulties under which it was given, and its value.

In the Department of the Tennessee, a Detachment of the Corps has served, in the past year, since the first attack on Vicksburg, and the subsequent attack against Arkansas Post.

In the progress of the grand siege of Vicksburg, the officers of this Detachment,—it being then just collected, and serving with all the disadvantages of an acting organization,—rendered such aid as they could. They were stationed on the vessels of the fleet, and with the troops, at different points, on the banks of the river. In the passages of the Vicksburg batteries by our steamers, running the blockade, signal officers were stationed on the vessels, and shared the risks of the exploit.

When in the movements turning Vicksburg, the Mississippi river was to be crossed, by our Army near Grand Gulf, the sta-

tions of the Corps were opened on the opposite banks of the river. In the marches and battles which followed, and at the battle of Champion Hills, the party serving with Gen. McPherson had the distinguished mention of that officer. At the first investment of the city, it fell to the Corps to keep the communication between the wings of our army and the naval forces above and below that fortress; a service at that time of importance. As the siege was prolonged, their service (though necessary and of a character that their default might have caused serious loss to our arms,) was not altogether satisfactory. Their field telegraphic trains, delayed at Memphis, did not reach them.

The officers reporting, deplore that such an opportunity for their service was lost.

A signal party took part in the operations in the Yazoo; in the descent of Admiral Porter to join Admiral Farragut at Red river; and in most of the joint operations of the land and naval forces. A small detachment also served, successfully, with Gen. Ellet's Marine Brigade.

In the Department of the Cumberland the detachment there stationed was present at the battle of Stone river. It is reported by General Rosecrans to have "done well." The field telegraph trains had not then reached them.

At the occupation of Murfreesboro', and in the operations in that vicinity, in the spring and summer, the party has been kept at work on stations of observation and communication. In the attack by the enemy on Franklin, it reported the need of aid, when the message could not well have otherwise gone. During the movement on Chattanooga, the line of signal stations is reported to have extended, at one time, a distance of eighty miles. The report of these operations, and the employment of the party at Chattanooga, with the accompanying maps, are herewith. The officers seem to have deserved and gained the confidence of General Rosecrans, who then commanded the Department.

A detachment now accompanies General Burnside in Eastern Tennessee and Kentucky, and smaller parties are with expeditions in Louisiana and Arkansas, and at different points along the Mississippi.

There are above stated, cursorily and in brief, some of the instances of service, selected from those mentioned in the mass of reports, and the correspondence on file at this office.

In a year's service, embracing occasions almost innumerable, and covering such vast operations as those in which these parties have striven to take part, there must be many incidents of failure and of disappointment. The accounts of these would not always come to this office clearly; and, sometimes, not at all. The Department has before it the data as they have been given to me. To arrive at fair decisions of general value, it is proper—certain successes being known to have been accomplished—to contemplate what disasters might have happened to our arms, and by consequence to the general service of our armies, had the aid, acknowledgedly given, in any one instance, failed to have been there given. I am of the opinion, that it can be held, in behalf of those whose time and labor have been devoted to this duty, that their service has been fully as arduous, and at least as successful as the general duty of that of any of the same number of persons in the Army.

#### LEGISLATION.

The legislation of the last Congress, providing the organization of the Corps, has had a good effect upon its service. It placed within the reach of many deserving men positions they had fully earned by labors in the field. Amounting, as it did, to a recognition of past services, and the pledged promise of the United States that those who were found worthy might, through it, obtain positions in a corps to which they had become attached, and in which they had freely risked their lives; shut out from the avenues of distinction, it encouraged all, and led to renewed labors with a reasonable hope of reward to be won by merit. This legislation has provided for the present wants of the Corps. The pay is liberally fixed, and the grades of rank and the duties are properly established. The rules for entering the Corps, either by commission or through the ranks, are so drawn as to open the highest offices to the aspirations of all. There is every proper

incentive, which law can give, to induce valuable men to the employ, and to lead them to a faithful discharge of their duties. There is placed in the hands of the executive, that control of the organization, and of its duties, which is right, of the inception of a service, which was at first only experimental. There is given to the Corps all that is asked for or required. Until this law has been once tested, by filling the Corps to its best organization, and putting it in service, under the law, the results of success to be expected from its working, or the duties of the Corps it provides, can be estimated only in imagination. I am of the opinion that no other legislation is needed. If the law, rightly constructed is carried out, and the Corps thereafter be wanting in success, the fault will be either in the officers who control it or with the material that represents it in the field.

#### PROGRESS OF ORGANIZATION OF THE CORPS.

In pursuance of the Act of March 3d, 1863, which provided for the organization of the Signal Corps of the Army, a board of officers was convened on April 13th, 1863, by order of the War Department. The importance of the business to be brought before this board had induced the request, on the part of the Signal Officer of the Army, that its members should be officers of known character and requirements. I do not think the selection made by the War Department could be improved; or, that a body of officers could be found to more considerably and faithfully discharge their duties, or with a more conscientious regard for the interests of the service, than that which has actuated these gentlemen through the prolonged sessions of the past summer. The order convening this board, has been modified from time to time, by the War Department. The board has acted with its best judgment to carry out its provisions. It was made a part of their duty to report on a plan of organization of the Corps; and on other matters pertaining to its duties, as their military experience, and their opportunities for investigation, might suggest. This report has already been submitted to the War Department. A copy (Appendix B,) accompanies this paper.

This report has been made, by the Board, after due consideration ; and, with full access to the records of the office, the official reports, papers, and other official information to be there obtained, in regard to the history of the Corps, its duties, and its progress from the beginning of the war. I fully concurred in the recommendations of this report ; and I respectfully advise their adoption.

The duties of the examination of officers, and recommendations for appointments, which devolved upon the Central Board, were of a delicate character. It was their province to discriminate between officers who have served gallantly and zealously from the beginning of the war ; and to fix their grades of rank, and relative standing. The lavishness with which, in the early days of the war, positions of rank were distributed, sometimes without regard to qualification, increased the difficulties of the task. It was necessary to recommend a reduction of rank in some cases ; in others, candidates were found disqualified to enter the Corps ; there were few prominent positions provided by the law ; the aspirants were numerous, and the claims of each were, in his own estimation, eminent. The qualifications, record of service, and conduct of each applicant, were the bases on which, to fix his standing. In this task of decision, the Board has proceeded with patience, kind consideration, and impartiality. The result of their action will be to render justice in the lists they present, insofar as is possible with human judgment.

On July 17th, 1863, orders issued from the War Department for the formation of other boards in the different military departments, with a view to the examination of the officers there serving, and to expedite the organization of the Corps. The constant moving of the great armies, with which the officers are in the field engaged in battles, marches, and sieges, have rendered it impossible to collect the reports of these boards rapidly ; or for the boards to continue in permanent sessions. Their meetings have been in tents ; and, in the case of the Board assembled on Morris Island, its sessions were held during the siege of Fort Wagner, and were nearly within the range of the enemy's artillery. The reports from the Departments of Virginia,

North Carolina, South Carolina, and the Gulf, are now complete. Those from the Department of the Tennessee, and of the Cumberland, though partially rendered, are not yet finished.

Boards for the examination of non-commissioned officers and enlisted men, have also been convened in each Military Department. Their recommendations for positions as sergeants and privates of different classes, are received. These Boards retain their organization for the examination, under the law, of such enlisted men as may be enlisted in, or transferred to, the Corps. On August 1st, 1863, in accordance with authority from the War Department, a Board convened at the Camp of Instruction, in Georgetown, D. C., for the examination for admission to the Corps, of such candidates (coming either from military or civil life,) as might be properly brought before it. It has been the rule of this Office, as it has been the understood wish of the War Department, to throw open this examination for the widest and fairest competition; to refuse to no respectable citizen of the United States permission to appear before the Board; and to be guided solely by the decision of the Board as to the recommendation of his appointment. The action of this Board, on which no influences are brought to bear, is impartial. The wide field for selection affords opportunity to obtain the best material. The qualifications of those applicants who have thus entered the Corps, have warranted the plan pursued. It is proper that the precedent thus established should be followed hereafter.

The organization has proceeded slowly, and with the difficulties necessary in such times as now. The papers, returns, and reports have had to be, some of them, devised, and all of them systematized. It has been necessary to impress upon the officers scattered throughout the United States, the fact of their accountability, and the necessity of rendering such reports and papers as the usages of the service require. An acting organization of equipped officers and men, has had to be kept everywhere in the field ready for service; and detachments of it moved from point to point, as in the immense campaigns (including those of all the Armies) new contingencies developed themselves. The views of this office have not always been those which seemed wise to the



Department; and from the plans proposed from it, there have sometimes been substituted those suggested by others. The perplexities have been numerous; there has been little time for consideration, and a necessity of constant action. The officers serving in the different Military Departments have had their embarrassments: they have been perplexed about the formation of boards; and the examinations to be passed. Persons illy disposed have annoyed them by discouraging reports as to the organization of the Corps. There have been the uncertainties, the little collisions, dissatisfactions, and hamperings to be expected in any incomplete organization. By this review, there is offered to the War Department an opportunity of estimating the difficulties under which the operations of the Corps have progressed. The general tone of feeling among the officers has been commendable. The acting organization have maintained and tried to perfect themselves in every Department. The records of the campaigns show that they have not been idle. Everything has been made to give way to active service in the field. Very few, if any of the Corps, have stopped to consider how it might effect their chances of appointment to have the lists hurried into the Department, when there has been an opportunity anywhere to show, by their deeds, that such appointment would be for the interest of the service, and that they were deserved. I recommend that no detriment be allowed to happen to any officer or man on the lists thus delayed. The necessary papers, lists, etc., are now so nearly complete, that the Corps can be put on a permanent working organization in a very few days after the receipt of the reports from the Departments of the Tennessee and the Cumberland. The recruiting service is organized and proceeds satisfactorily.

#### ORGANIZATION OF THE OFFICE OF THE SIGNAL OFFICER.

By the legislation of last session Congress provided for two clerks, of class two, in the Office of the Signal Officer. With the appointment of these clerks the Office assumed a permanent organization. This Office has been, since soon after the begin-

ning of the war, an office for records; for the issuing of orders; a purchasing and disbursing office; an office for the issuing of supplies to officers, and for the auditing of their accounts; the headquarters of the Corps; and, virtually a bureau office. The records of the Corps are now complete. Since October 1st, 1861, the office has issued all necessary supplies to each Chief Signal Officer in the several Military Departments of the United States.

The property accounts of Signal Officers, with one or two exceptions, have been rendered and examined to the 30th September; and (to the number of 1,000) are now in the hands of the Second Auditor. When the difficulties peculiar to duties of such varied kinds, with a new army, in time of war, and an organization made up of volunteers, are considered, a result of this character, is cause for satisfaction. The credit for the systematic arrangement, and the precision which have made it possible, are due to Messrs. White and Ashley, the appointed clerks, upon whom has devolved the real labor; and to the energy and care of Captains Cushing, Hepburn, Spencer, and Taft, who have been on duty at different times since the establishment of the office. The office organization is now complete for any possible extension of its duties.

#### PLANS AND DEVICES.

A number of plans or devices having reference to ærial electric telegraphy have been, during the past year, submitted to this office. A detailed account of these cannot properly accompany this paper. The number of plans and of models submitted, has rendered it necessary that a general rule should be adopted in reference to them. It has been the usage, for this reason, to submit each to a board of officers, for examination and report. This report with the writings, models, and plates accompanying each device are directed to be kept on file in this office for reference. Among the plans submitted have been ingenious devices for signals and ciphers; signal torches; rockets and signal lights of various constructions; specimens of insulated wire; of double wire; and of wire twisted to be made flexible; different varieties

of electric instruments for field use; plans for field trains; observatory towers, etc.

The war has brought forward numerous inventions for this service.

The different varieties of apparatus carried with our armies in the field, crude as some of them are in this the first year of their use, have been the subject of attentive study by the agents of different foreign powers who have visited our encampments.

#### INSTRUCTION AT MILITARY AND NAVAL ACADEMIES.

The course of instruction commenced at the Naval Academy, at Newport, R. I., to which reference was made in my last report, has been continued, as I am informed, at that institution during the past year. A communication from Lieutenant-Commander S. B. Luce, U. S. N., the officer charged with the duty by the Navy Department, states: "At the coming June examination, twenty-one (21) midshipmen leave the academy for active service. I shall make a special report of the fact to the Department, that they may be sent on board different vessels, and thus the entire number be made available at once. In October next thirty-one (31) more midshipmen, competent to act as Signal Officers, leave the academy, and the wants of the Navy will be, in a very great measure, supplied."

Practical illustration of the progress and skill of the second class were, I believe, given before the board of visitors at the annual examination at the Naval Academy of this year. A copy of the official report of Lieutenant-Commander Luce to the Commandant, in reference to the first class instructed at the Naval Academy, is herewith. (Appendix D.)

In July last, instruction in Military Signals and Telegraphy was made, by order of the War Department, part of the course of instruction at the Military Academy at West Point. Captain Samuel T. Cushing, Acting Signal Officer, with proper assistants, was detailed for this duty. The course has been ably conducted by this officer. It has embraced instruction in the drill and management of signal parties, the theory and practical use of

ærial and electric telegraphy, and a thorough field practice with the field-line mode used in the Army. At the last reports of the officer on duty, the first class of Cadets had so far advanced as to read easily, by day or by night, communications telegraphed with flags or torches from Newburg to West Point, a distance of eight miles. They have studied, by practice, the working of the light field telegraph lines, which come within the management of the Corps. The course to be conducted by Captain Cushing and his assistants would embrace practice on these lines, and the modes of working in their common use. A detailed report of the plan of instruction pursued, and the results, is furnished by the instructing officer, and is herewith laid before the Department. (Appendix E.) The addition of this branch to the studies before pursued at the Military Academy promises, in my opinion, an advantage to the service.

The use of field signals and field telegraphic lines has now become so common in military operations that an officer can hardly be considered instructed who is not informed as to their employment. This especially applies in the existing war.

The land and naval forces of the enemy seem to be well supplied with practical signal officers; and military operations on land bring our forces continually in view of hostile signal stations of whose powers our officers ought to be able to judge. The accounts which reach us of the rebel navy at sea indicate the habitual use of those plans of signals first introduced in our armies. The officers of our navy, experienced in this war, will be able to estimate the advantages thus gained.

#### FIELD TELEGRAPHS.

The service of the field telegraphic trains in the hands of the corps, and making part of its equipment, has been conducted with a fair, and, in some instances, a marked success in the different Military Departments. The liberality of the War Department has allowed a development of this branch of the duty greater than was recommended at the date of my last report, and with results which have justified the action. It remains, in

my view, only to follow the path of development indicated by the experience of the past year to secure for our armies a service of field telegraphs, with portable lines, so superior as to render our advance in improvements of this character as notable as those which have marked the progress of our armies in other branches of military appliances.

In my last annual report there was brought to the attention of the Department the improvement in telegraphic apparatus, which the ingenuity of American artisans, stimulated by the field opened to them by this war, and the call for improved equipments for the trains for the Signal Corps of the army, had inaugurated. The practical experience of the past year, indicating the wants of the service, and the same ingenuity constantly exercised to overcome these wants and to perfect the material, have led to developments in the art which are now attracting the attention of electricians; and which, if they fulfill the promise of their seeming, will go far to revolutionize the appliances for the transmission of signals by electricity. It is already a subject of consideration whether the appliances and the mode of generating a magneto-electric current, as first used for telegraphy in this country, in experimental instruments made for the Signal Corps, to dispense with the clumsy and untransportable Voltaic-battery, are not those appliances and that mode which will be necessary to transmit signals through submarine cables of uncommon length, as that proposed to cross the Atlantic. This is, of course, theoretical only. The official reports of these lines are herewith.

The use of these instruments in the army has led, incidentally, to their examination for the naval forces of the United States. Their use for civil purposes attracts attention. The ingenuity of the inventor, Mr. G. W. Beardslee, of New York, turned to the subject of increasing the powers of the instruments to enable them to work at greater distances; and to apply the magneto-electric current in the same manner as generated in the field machinery, under circumstances where, with the first devised instruments, it was difficult or impossible, has produced, with a construction novel in this country and in Europe, a signal sounder

by which the signals transmitted are addressed to the ear. Messages transmitted by this instrument may be read as with instruments of common usage.

Experiments have been ordered with this apparatus.

If, as is the opinion of the inventor, it can be used at any great distances, and with the compact and perfectly transportable apparatus of the magnetic instruments of field trains, it promises a development of field telegraphy before impossible, and will favorably influence the telegraphic enterprises of the country.

Should the experiments warrant the course the signal trains of the Army will be equipped with both the dial instruments already in use, and the instruments now mentioned. There are opportunities for the employment of both. It is with some gratification that the attention of the Secretary of War is invited to these results. The credit of whatever success shall hereafter attach, in civil or military use, to American apparatus based on these principles, and on this style of its application, will be largely due to that wise view of the War Department which first gave it opportunity of development.

During the past year there have been in the service of the Corps thirty (30) field trains, distributed as follows:

In the Army of the Potomac, - - - - -	5
“ Department of the Cumberland, - - - - -	5
“ “ “ Gulf, - - - - -	3
“ “ “ North Carolina and Virginia, - - - - -	3
“ “ “ the South, - - - - -	2
“ “ “ the Tennessee, - - - - -	6
“ “ “ the Ohio, - - - - -	2
At Signal Camp of Instruction, Georgetown, D. C., - - - - -	3
At U. S. Military Academy, West Point, N. Y., - - - - -	1
Total, - - - - -	30

Seventeen (17) have been distributed since May 1, 1863. Of these trains some have been equipped with five, and others with ten miles of insulated wire. There are carried with the

trains lances for setting up the wire, where that is necessary; reels, portable by hand, carrying wire made purposely flexible for this particular use; and various minor appliances, which experience has proved useful. A military organization is directed for each train. (Appendix C.)

In duty of this kind the style of construction of the trains, the equipment they are to carry, the military organizations to be provided for their use to enable them to be moved rapidly, and anywhere brought into action, are subjects for study. The particular instruments to be employed are for secondary consideration.

The soldiers, drilled to the duty of construction, acquire in a short time a remarkable skill in the rapid extension of these lines. As was anticipated, they have proved valuable auxiliaries to the service of the Corps, and have sometimes rendered them available when they would, without, have been impossible.

The greatest reported distance at which these instruments have worked is something over twenty miles. The average distances at which they are now used are from five to eight miles. The average speed of the most rapid construction is reported to be at the rate of a slow walk.

At the first battle of Fredericksburg field trains were first, in the history of the war, used on the battle-field, under the fire of the enemy's batteries. The movements to be made on the day of that battle were of the first magnitude. The movements of the retreat were perilous to the whole Army. The trains in use contributed something to the success of these movements.

At the battle of Chancellorsville several lines were extended. The shorter worked successfully. The longer failed. This failure was not, however, wholly the fault of the officers in charge. Success cannot always be commanded.

In the rapid movements of the Army of the Potomac these lines aided materially in establishing that communication between the scattered Army corps, which afterwards rendered their sudden concentration before the enemy at Gettysburg possible.

The siege of Charleston afforded a fair field for the use of these trains. They have been skillfully handled by the detachments of the Corps there serving. The reports at this office would indicate their employment as a success. For the hundred days of the siege now past the communications with General Gilmore's troops in the trenches and in reserve have been kept with field lines, pushed forward and maintained under the fire of the enemy, and advanced with the advance of our troops to the furthest point reached by our forces at Fort Gregg.

At the siege of Fort Wagner the lines were so close to the enemy that his sharpshooters fired at the wire. It was repeatedly cut by pieces of shell. The wire was mended by soldiers of the Corps, who were exposed to a dangerous fire of grape.

One of the first instances on record of a soldier actually wounded at the instruments is that of Sergeant Emerson, of the Signal Corps, who was seriously wounded by a shell, which destroyed, in its explosion, the splinter-proof in which he was working in the parallel, and buried himself and Lieutenant C. F. Cross, the officer in charge, some feet in depth in sand. These instances are mentioned as illustrative of the mode in which the portable lines of the Corps should be worked. Their use has been, here as elsewhere, supplementary to the use of the flags and the other ærial signals by which the Corps keeps its communications.

Thus, while these communications existed in the trenches, in front of Charleston, constant communication was kept with the fleet in the bay and the river on both flanks of the Army, and from signal towers with different divisions of the forces.

The portable lines, as can be judged by the dates at which their distribution commenced, have been so little in use in the different departments that the results cannot, at present, be properly judged. There are only general reports from the Departments of North Carolina and Virginia, the Departments of the Gulf and of the Tennessee. There are trains in the field bearing a part in the operations in each of these departments. The general tenor of the reports indicates a fair success.



A summary report, in reference to the average working of this apparatus for the past year, has been called for, and will be laid before the Department.

There have been, of course, as it was reasonable to expect, accidents; sometimes incompetent management; and such errors as were to be anticipated at the commencement and in the early progress of such a service.

The service rendered, however, has not failed to be of very essential value. The equipment of the trains, while it can be improved, seems to be, in its general character, proper for the purpose intended; while the material carried by them has been useful.

Questions have arisen as to the distance at which lines can be worked by the instruments carried by these trains; and, also, as to the durability of the instruments. I am of the opinion that, with proper care, the dial instrument will be sufficiently durable for the purposes to which it will be put. The distance of working can be increased with improved instruments or proper modification of the apparatus.

The expense attending this service is trivial, compared with the results it is capable of accomplishing. With proper organization and management I think it can be so reduced as to make it, admittedly, one of the cheapest, as well as effective, branches of the Service.

The experience of the past year has thus confirmed the views, before brought before the Department at the outbreak of the rebellion, and in the annual reports of 1861 and 1862, of the importance to the Signal Service of field telegraphic trains, with portable lines; that is, lines to be transported, with instruments and appurtenances complete, and to be set up anywhere the exigencies of the Service may require.

The service of these trains is a necessary branch of corps duty; and from the beginning of the war it has been aimed to perfect it.

The facilities placed within the control of this Office by the War Department, and the appropriation granted at the last ses-

sion of Congress for the purpose will permit it to be tested to its full efficiency.

I am, sir, very respectfully, your obedient servant,

ALBERT J. MYER,

*Colonel and Signal Officer of the Army.*

To the Hon. E. M. STANTON,

*Secretary of War.*